



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D3391-025
Job Sheet 176047



Part No: D3391-025

Job Qty: 1 ea

Part Name: Aft Tube Assembly



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 4/16/18

Job Tracking No:

Due Date: 5/24/18

Created By: Marie Lajeunesse

Type: SOLD

Description:

Note: DWG REV J SHEETS 9,10,11 IPP Rev B 06-02-07 ECN773 dwg rev. D EC IPP Rev: C 06-03-28 Update
Manuf. Instructions JLM IPP rev D 07.03.20 rev F dwg EC IPP rev E 07.11.07 rev G dwg ecn 1053p EC verified
by: DD IPP Rev: F 07-11-13 ECN 1056 DD verified by: EC IPP Rev: G 08-09-10 revH as per dwg DD verified
by: EC IPP Rev: H 11.11.14 AS PER REV. I DD verified by: JLM

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard Setup Run hrs Hrs	Workcenter/Supplier	Lead Time	Sign-off
90	Start up Operation	1 Ea	5/23/18	5/23/18	0.00 0.00	Start Up Crosstubes		DAS
100	Mori Seiki	1 pcs	5/23/18	5/23/18	2.49 4.17	Mori Seiki TL-40		56
110	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC2-1		9-89
112	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC5		93
120	CNC Vertical Machining	1 pcs	5/23/18	5/23/18	0.00 2.63	HAAS1-3		Kt 2018-05-16
130	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC2 Machining-2		Kt 2018/05/16
140	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC8 Machining-2		9-18-05-24
150	Skidtubes	1 pcs	5/23/18	5/23/18	0.00 1.03	Skidtubes-4		MLG
160	CNC Bend Skidtubes	1 pcs	5/23/18	5/23/18	0.00 1.33	CNC Bend Skidtube		MLG
170	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC5		BE
180	Skidtubes	1 pcs	5/23/18	5/23/18	0.00 1.03	Skidtubes-4		MLG
190	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC5		93
200	HandFinish	1 pcs	5/23/18	5/23/18	0.00 0.58	HandFinish1		BE 18-05-28
210	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC7-2		BE
220	Skidtubes	1 pcs	5/23/18	5/23/18	0.00 1.41	Skidtubes-4		MLG
230	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC5		MLG 18-5-29
235	HandFinish	1 pcs	5/23/18	5/23/18	0.00 0.58	HandFinish2		BE 18-05-29
240	SprayPaint	1 pcs	5/23/18	5/23/18	0.00 0.25	Spray Paint		N/A
242	Outsource	1 pcs	5/23/18	5/23/18		ATE003-VC		PR40046
250	QC	1 pcs	5/23/18	5/23/18	0.00 0.00	QC14		MLG
260	HandFinish	1 pcs	5/24/18	5/24/18	0.00 0.58	HandFinish4		MLG 18-5-30
270	QC	1 pcs	5/24/18	5/24/18	0.00 0.00	QC5		MLG 18-5-30
280	Packaging	1 pcs	5/24/18	5/24/18	0.00 0.00	Packaging3-1		MLG
290	QC21-SA	1 Ea	5/24/18	5/24/18	0.00 0.00	QC21		MLG

Part Op 100 - Turn as per Folio FA599 Rev: _____ & Dwg D3391 Rev: _____ ***ensure steady rest is turning true*** REMOVE
Descriptions: STEADY REST AND MACHINIG MARKS****

120 - 1-Machine as per Folio FA 599 Rev: _____ & Dwg D3391 Rev: _____

140 - ***INSPECT INSIDE BORE***

150 - 1-Drill (PILOT HOLE) aft cap holes per Dwg D3391 using DT8803

160 - Form as per Dwg D3391 Using Bend Prog 3391025

180 - 1-Open Aft cap pilot hole to .208" as per Dwg D3391 2-Drill float bag holes using DT8809 as per Dwg D3391 (Holes marked "A" Only. 3-Drill wearplate holes as per Dwg D3391 using DT8878(Mid Tube) & DT8217 Wearplate Jig . *****Do

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rew _____ Sc _____ Use-a _____ Suspected Unappro _____		AGAINST DEPARTMENT/PROCESS DART AEROSPACE Container No: S063137 Part: D3391 - 025 Job No: 176047 Serial No/Batch: S063137 Revision: _____ Inspector: _____ Date: 04/20/18 DART Aerospace Ltd. 1270 Aberdeen Street Newbury, ON K8A 1K7 CANADA TEL: 1 613 622-8200 Email: sales@dartaero.com www.dartaerospace.com	
Date :		Step #:			
Description Work Order Deviation					

Root Cause			FAULT CATEGORY		
Environment	☐	No Re-verification	☐	Pressure/Forced	☐
Design	☐	Operator	☐	Bending	☐
Doc/Data	☐	Offset/Setup	☐	Centre Not Concentric	☐
Equip/Tooling	☐	Supplier	☐	Cracks	☐
Handling/Pre	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐
Material	☐	Use for Testing	☐	Cuffs	☐
Internal Transport	☐	Poor Information	☐	Crushing	☐
Tribal Knowledge	☐	Rushing	☐	Heat Treat	☐
LOA	☐	Product Improvement	☐	Wave/Twist in Tube	☐
Substation	☐	Process Improvement	☐	Marks/Chatter	☐
Past Expiry Date	☐	Manufacturing Process	☐	OTHER :	☐
Misidentified	☐	Past Due	☐		

Not Open To Finished Size***** 4-Drill Wearshoe holes as per DWG D3391 using DT8939 locating from 2 previously drilled aft wearplate holes. 5-Open wearplate holes to 0.297" and c'bore as per dwg D3391 6-Open up all float bag holes to 0.328" and c'sink as per Dwg D3391. 8- Scribe batch # on fwd end

220 - 1- Instal spacers as per dwg D3391 A/R Magnabond 6398 Batch: 137073 exp. date: 18-08 cure time 12hrs as per QSI0015 2- Grind crossbolts flush 3- Back drill using #9 drill 4- Touchup Magnabond 5- Deburr

235 - AND REALODINE AS PER PAR09-043

240 - PRIME AS PER DWG AND QSI005 4.2.1.3.3

260 - 1-Install inserts as per Dwg D3391 2-Install Aft Cap as per Dwg D3391 A/ R Sikaflex-241/-291 M138787

Sikaflex expiry date: 18/12 3- INSTALL WEARPLATES AS PER DWG

290 - 5- Detail DD, open (5) forward wearplate holes 0.375", then use DT10247 and drill holes for nutplates and c'sink. 6-Open wearplate holes to 0.297" and c'bore as per dwg D3391. ***SIX FARTHEST AFT HOLES ONLY*** 7-Open up all float bag holes to 0.328" and c'sink as per Dwg D3391. 8-Deburr 9- Scribe batch # on fwd end

003534

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D6014-090	Aluminum Extrusion	1 Ea (1 ea)	90-Start up Operation	
D3670-4-200	Bushing	4 Ea (4 ea)	220-Skidtubes	
ALS4-1032-130	Rivnut	8 Ea (8 ea)	260-HandFinish	S 021404
ALS4-1032-225	Rivnut	4 Ea (4 ea)	260-HandFinish	5008959
AN3C4A	Bolt	6 Ea (6 ea)	260-HandFinish	5058138
AN3C5A	Bolt	4 Ea (4 ea)	260-HandFinish	5041111
D2646	Aft Cap	1 Ea (1 ea)	260-HandFinish	5057153
D3672-1	Washer, Phenolic	2 Ea (2 ea)	260-HandFinish	F165010
D4095-047	Wearpad Aft	1 Ea (1 ea)	260-HandFinish	F150074
D4095-049	Wearpad Aft	1 Ea (1 ea)	260-HandFinish	5025091
MS20601-AD4W3	Rivet	12 Ea (12 ea)	260-HandFinish	5018296
MS20601-AD4W7	Rivet	8 Ea (8 ea)	260-HandFinish	5066193-1
MS21075L5	Nut Plate	10 Ea (10 ea)	260-HandFinish	M137148
NAS1149C0332R	Washer	10 Ea (10 ea)	260-HandFinish	5004858
				5056493

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D6014-090	1	27	0
220-Skidtubes	D3670-4-200	4	48	0
260-HandFinish	ALS4-1032-130	8	14,777	0
	ALS4-1032-225	4	5,662	0
	AN3C4A	6	2,277	0
	AN3C5A	4	2,095	0
	D2646	1	100	0
	D3672-1	2	1,071	0
	D4095-047	1	11	0
	D4095-049	1	38	0
	MS20601-AD4W3	12	249	0
	MS20601-AD4W7	8	185	0
	MS21075L5	10	174	0
	NAS1149C0332R	10	6,563	0

Part Specifications

Specifications could not be found.

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____			
Misidentified ☐	Past Due ☐				

DART AEROSPACE LTD		Work Order: 176047
Description: Float Skidtube (412)		Part Number: D3391-3
Inspection Dwg: D3391 Rev: J		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Lathe Section						
14.000	+/-0.010	14.0	✓		TAPE	
3.500	+/-0.010	3.499	✓		VERNOB	
Ø3.200	+/-0.010	3.200	✓		↓	
Ø3.750	+/-0.010	3.752	✓		↓	
30° x 0.060 chamfer	+/-0.010	.070	✓		↓	
88.93	+/-0.030	DAS 56 88.93	✓		TAPE	

Measured by: 9-89	Date: 2018-04-18
Audited by:	Date:

HAAS Section						
1.526	+0.000/-0.030	1.515	✓			
7.500	+/-0.010	7.502	✓			
27.750	+/-0.010	27.752	✓			
31.750	+/-0.010	31.752	✓			
35.250	+/-0.010	35.252	✓			
3.300	+/-0.010	3.303	✓			
0.200	+/-0.010	0.200	✓			
3.520	+/-0.010	3.525	✓			
0.687	+0.010/-0.000	0.687	✓			
R0.062	+/-0.010	0.0625	✓			
Ø0.484	+0.005/-0.001	0.484	✓			

Measured by: 1 KT	Date: 2018-05-16
Audited by: 9-89 gmk	Date: 18/05/24

Rev	Date	Change	Revised by	Approved
A	06.04.24	New Issue P/O D3391-015/-025	KJ/JLM	
B	06.06.19	Dwg revision update	KJ/JLM	
C	07.04.20	Ø0.208 dimension removed	KJ/JLM	
D	07.09.06	0.400 dimension removed	KJ/JLM	
E	07.11.23	Dwg Rev. updated	KJ/EC/DD	
F	09.04.27	Dimensions updated per Rev H and NCR09-028	KJ/JLM	
G	09.11.16	Dimension 0.200 removed	KJ	
H	11.06.21	Dimension 44.995 removed	KJ	
I	12.05.15	Dwg Rev updated	KJ	
J	12.05.23	Dimension updated	KJ	
K	12.10.15	88.93 dimension removed	KJ	
L	12.11.28	88.93 dimension added	KJ	
M	16.06.23	Dimensions updated per Rev J	KJ	

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

DQA: _____ Date: _____

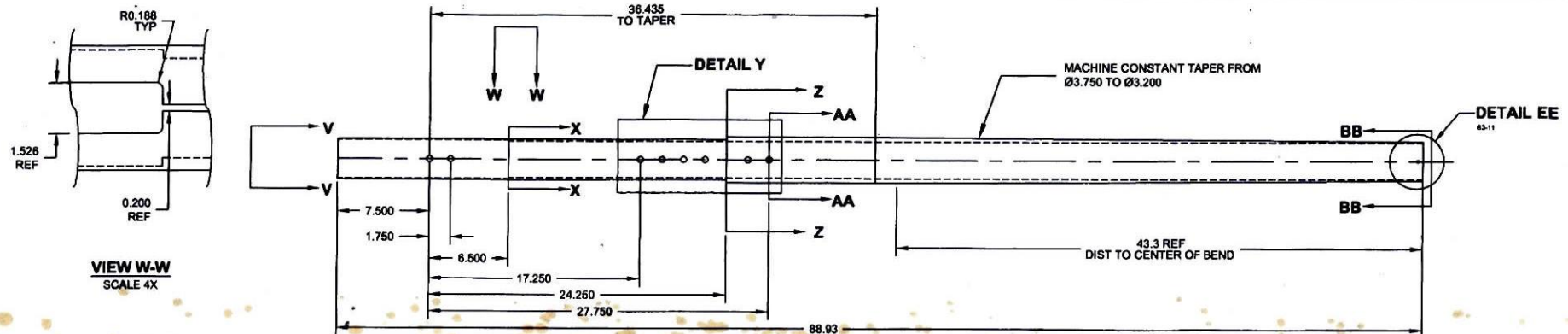


WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

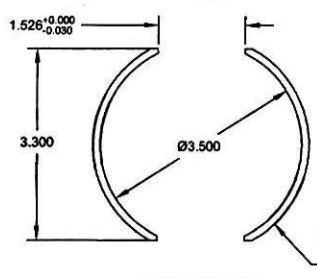
Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER :					

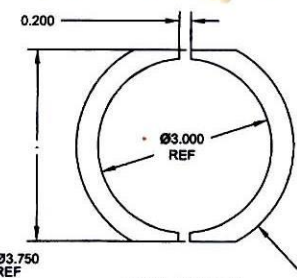


VIEW W-W
SCALE 4X

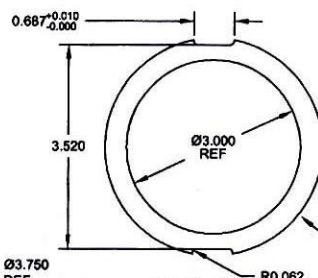
D3391-3 AFT DRILLING AND CUTTING DETAIL
(MAKE FROM D6014-090)



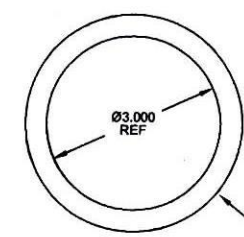
SECTION V-V
SCALE 4X



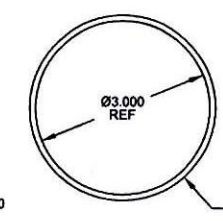
SECTION X-X
SCALE 4X



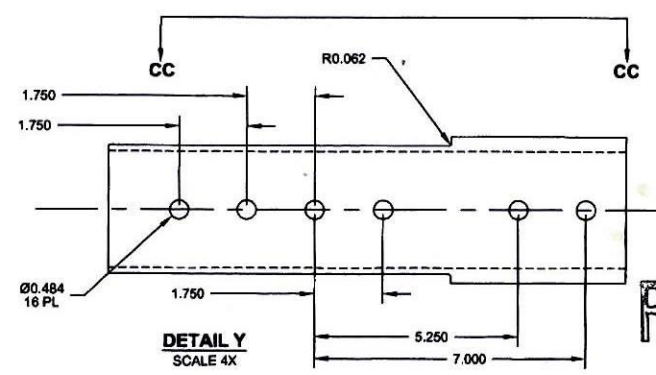
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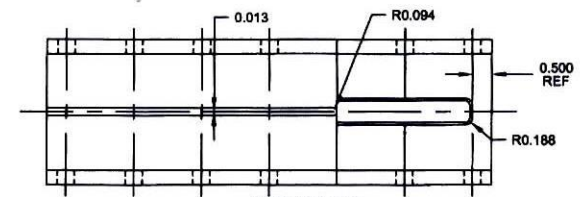
SECTION AA-AA
SCALE 4X



SECTION BB-BB
SCALE 4X



DETAIL Y
SCALE 4X



VIEW CC-CC

RELEASED
2016-04-28

DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	ML	EUGENE, OR	
CHECKED	CP	DRAWING NO. D3391	REV. J
MFG. APPR.		SHEET 10 OF 11	
APPROVED		TITLE 412 FLOAT SKIDTUBE	SCALE NTS
DE APPR.		COPYRIGHT © 2005 BY DART AEROSPACE USA, INC	
DATE	16.01.14	THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.	



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO040046**

Supplier: ATE003-VC
Atelier Debosselage
358 Principale
Calumet
QC
J0V 1B0 Canada
Phone: 819 242 5633

PO No: PO040046
PO Date: 5/30/18
Due Date: 5/30/18
Purchase Order
Revision:
Revision Date:
Ship-To Contact: Lavoie, Chantal
clavoie@dartaero.com

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items

Line Item	Job	Part	Description	Status	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	176039	D3391-021	Fwd Tube Assembly	Firmed	5/30/18	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
	176040			Firmed	5/30/18	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
Sub Total:						2	0	2		\$250.00
2	175483	D3391-025	Aft Tube Assembly	Firmed	5/30/18	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
	176047			Firmed	5/30/18	1 pcs	0 pcs	1 pcs	\$125.00/pcs	\$125.00
Sub Total:						2	0	2		\$250.00
Grand Total:										\$500.00

Order Notes

reid A119/05/30

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

CL

Plex 5/30/18 8:27 AM dart.lavoie.chantal